

Tablet PCs can increase
student engagement & motivation.
How can you put that to
work in your class?

Stage 1: Need

- Ability to hand write instead of type
- Capture signatures electronically
- Portable touch screen

Tablet PCs fulfill the need to be able to hand write input into a computer instead of having to type. This is useful in instances when a person cannot or doesn't know how to type, or if someone is a slow typist and prefers to hand write for speed purposes.

A tablet PC also enables someone to sign something in an electronic format. This feature has many uses for legal documents and other things that require someone's signature.

For people who have problems using a mouse, the touch screen feature of a tablet PC enables the user to operate the computer by touching the screen.

Stage 2: Research

- Early pen technology in late 1980s (Blickenstorfer, 2005)
- Handwriting recognition
- NestorWriter handwriting recognizer
- 1991 started hype for pen computing (Blickenstorfer, 2005)
- Pen Extensions for Windows 3.1

Some said that pen technology would replace keyboards. Handwriting was easier than keyboarding.

Dr. Charles Elbaum created the NestorWriter. Communication Intelligence Corporation created another handwriting recognition software, and there were many other types of this software developed also (Blickenstorfer, 2005).

Was thought that the pen would replace a mouse and pen computers would replace desktops.

Stage 3: Development

- 1992 products released
 - GO Corporation PenPoint
 - Lexicus Longhand handwriting recognition software
- IBM ThinkPad
- Between 1992-1994 number of companies released pen computers
- Technology was not ready
- Too difficult to replace keyboard input with pen & voice input
- Tablet PCs released by Microsoft in 2002
- Uses “Digital Ink” as well as handwriting recognition
- Has keyboard

IBM ThinkPad was first a slate computer

All from Blickenstorfer, 2005

Stage 4: Commercialization

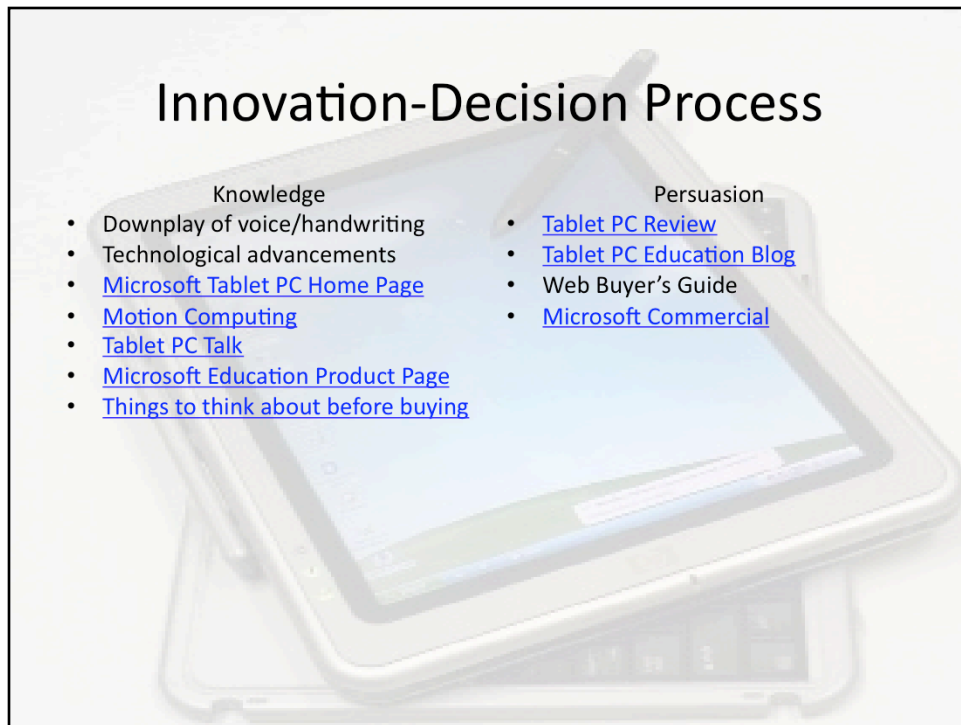
- In early 1990s, press enthusiastic then critical
- Big names in computing
 - Microsoft, IBM, Compaq
- GO lost \$70 million
- Microsoft promoting “Digital Ink” features & downplaying handwriting recognition

All from Blickenstorfer, 2005

The press was enthusiastic about the pen computers until they were unsuccessful & then they criticized the technology (Blickenstorfer, 2005).

GO lost \$70 million when pen computing failed to diffuse

When tablet PCs were introduced in 2002, Microsoft talked up the “digital ink” feature of the tablet PCs and did not mention much about the handwriting recognition features.



When Microsoft launched the Tablet PC, they chose to downplay its voice and handwriting recognition capabilities. This is because the recognition software does not work the way a user would like it to. It is difficult to get recognition software to automatically recognize someone's handwriting or voice. The user is required to do a lot of adapting to the software as opposed to being able to talk or write as normal. The software is not able to adapt to the user. This frustrates many users who think that they should just be able to use the software immediately and have the computer recognize their speech or handwriting. Microsoft chose to advertise the other capabilities of the Tablet PCs. For example they discussed how the tablet PC uses digital ink. Users write on the screen and the computer captures their handwriting digitally. This can be saved and accessed later.

In the early 1990s when slate computers were first introduced, the technology available at that time was not able to support what they were supposed to be able to do. In 2002, when the tablet PC was introduced, advancements in technology enabled it to perform much better than the earlier slate computers did.

The Web Buyer's Guide has reviews of Tablet PC educational software.

This article gives a number of things to consider before buying a tablet PC. For example slate vs. convertible, optical drives, screen size, software, warranty, etc.

Innovation-Decision Process Continued

Decision

- [Top 10 Benefits of Tablet PCs in Education](#)
- ISTE Book: *Tablet PCs in K-12 Education* by Mike VanMantgem
- [Tablet PC vs. Whiteboard](#)

Implementation

- [New York Times Article](#) (2004)
- [Games](#)
- [Use in Engineering Education](#)

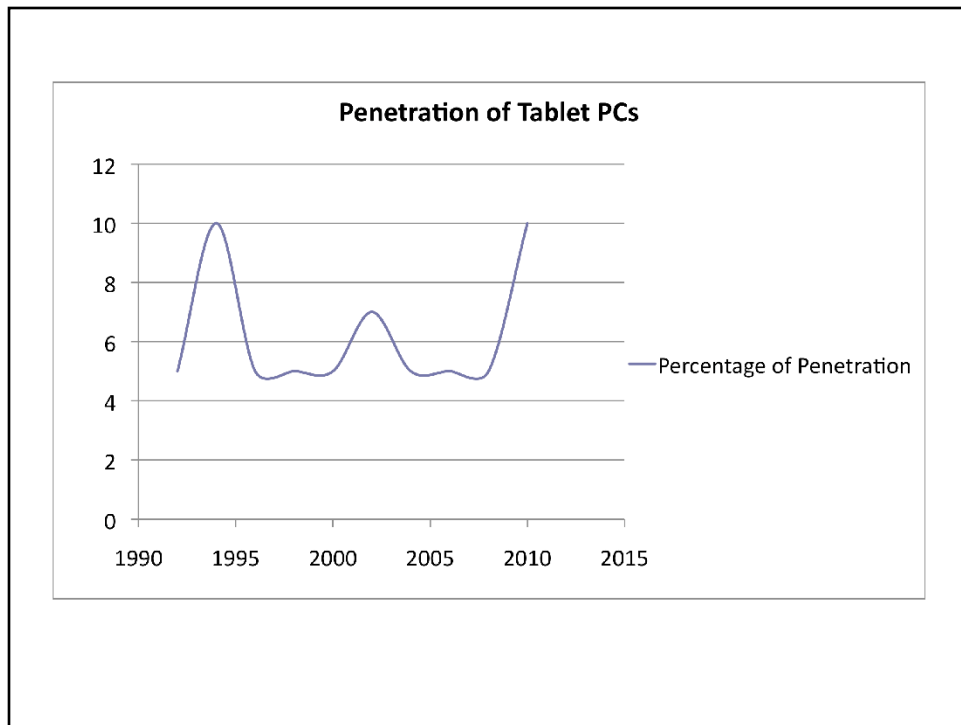
This New York Times article discusses how tablet PCs are being used in today's classrooms by students. It gives examples of how they can be used to eliminate the need for paper notebooks, improve interaction between teachers and students, and eliminate the amount of "busywork" that teachers assign.

There are a number of online games that students can play using their tablet PCs. This link shows math games. One of the math games helps students learn about coins.

Confirmation

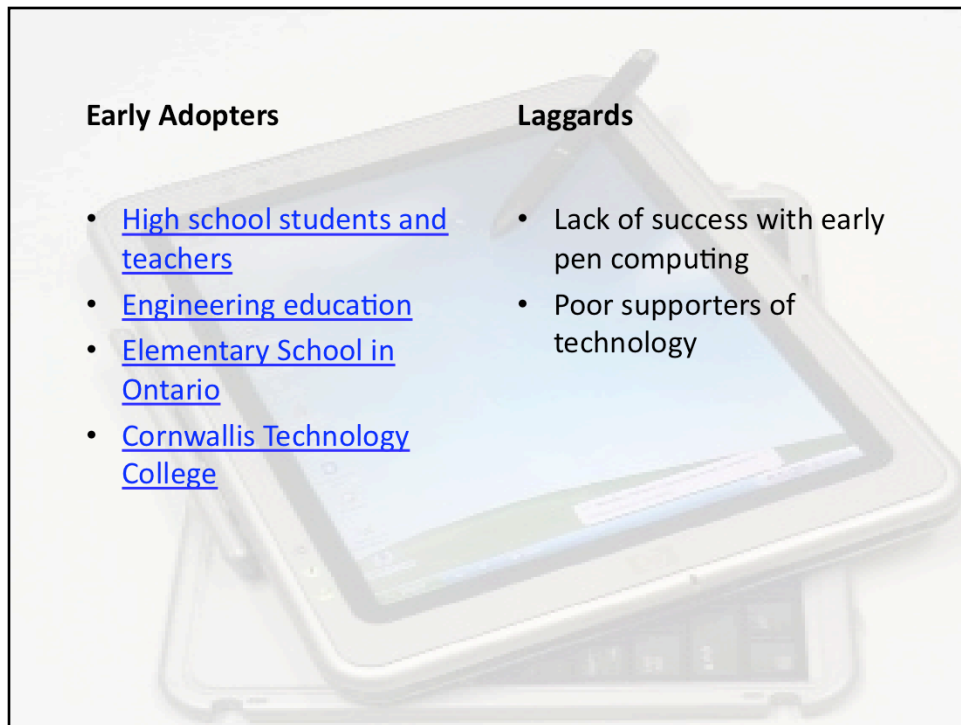
- [Software available for Tablet PCs](#)
- DyKnow Vision Educational Software
 - Enables students to take notes
 - Notes taken in annotated fashion in content
- Table PC enhancements for existing software (i.e. Microsoft Outlook)
- [Use of Tablet PCs at Clemson Univeristy](#)

There are numerous software programs that are available for tablet PCs. Since people are using the tablet PCs, there is a need for specialized software. If the tablet PCs were not being used, this specialized software would not exist.



In the early 1990s when the pen computing was first introduced, there was minor penetration of this technology. After 1994, pen computing was basically a dead technology. In 2002, Microsoft introduced the tablet PC. With the introduction of tablet PCs, Microsoft had a 7 year plan for the full penetration of them. Part of that plan involved the release of Windows Vista and specifically a version of Vista that supported the tablet PC platform. Microsoft is not displeased with the penetration of the tablet PC thus far because they anticipate penetration levels to greatly increase after the introduction of Vista to support tablet PCs. They feel that the tablet PC is following their predicted pattern for penetration.

Reference: Walker, 2005



High school students in Erie, PA piloted a tablet PC program in 2004. The students enjoyed using the tablet PCs to enhance their learning, and especially liked the pen format for input. (Fitzgerald, 2004).

Penn State University integrated tablet PCs into their engineering courses. They studied the benefits of the tablet PCs for both the students and professors. (Tablet PCs in Engineering Education, 2005).

An elementary school in Ontario, CA purchased tablet PCs in 2003 for their students to use in the classroom. The tablet PCs were able to nearly replace all paper in the classrooms they were used in. (Reid, 2004)

The Cornwallis Technology College purchased tablet PCs in 2002 to be used by students. The teachers and students enjoyed using the tablet PCs and especially liked the hand writing features of the tablet PCs. (Using RM Tablet PC at the Cornwallis School, 2009)

A lack of success with the early pen computers may be a deterrent to the diffusion of tablet PCs. This may cause some people to be laggards when it comes to tablet PCs.

If someone is not a strong supporter of technology use in the classroom to begin with, then they will probably be laggards for diffusion of tablet PCs as well.

Perceived Attributes

- Relative advantage
- Compatibility

In order to diffuse tablet PCs in education, I think that educators, administrators, and parents need to realize the relative advantage that tablet PCs have over other educational technologies. They would also have to realize the compatibility that tablet PCs have to enhancing students' educational experiences. (Rogers, 2003)

Approach to Diffusion

- Decentralized
- All students in class
- Multiple grade levels

In order to diffuse tablet PCs in a K-5 elementary school, a decentralized approach will be used in that all students within a class will have the opportunity to utilize the tablet PCs. This is opposed to only having a small group of children use the tablet PCs (i.e. the students in the talented and gifted (TAG) program). We would want to see how all students use the tablet PCs in order to determine their effectiveness in our classrooms.

Also, the tablet PCs will be used by students at multiple grade levels as opposed to only have students from one grade level use them. Again, we would want to see how all students use the tablet PCs.

Change Agents

- Members of technology department
- Library media specialists
- Teachers who have used tablet PCs with students

Within the school, members of the technology department will be called upon to be the change agents. The tech department members will be able to understand the functionality of the tablet PCs and suggest how they can be integrated into classrooms. Library media specialists in the school will also be change agents because they understand the curriculum at each grade level and can work with the technology department members to determine how the tablet PCs can be integrated into the curriculum. The technology department members and the library media specialists will work with the classroom teachers to help the classroom teachers use and integrate the tablet PCs.

Communication with teachers throughout the country who have already been using tablet PCs will be encouraged. Having our teachers talk with other teachers who are using them will help our teachers implement their use in our classrooms.

Achieving Critical Mass

- Not at critical mass yet
- One teacher per grade level 1-5

According to Andrews (2005), Microsoft anticipates full diffusion of the tablet PCs in 2010 thanks to the release of Windows Vista. This means that the tablet PC will hopefully meet critical mass soon.

Rogers' third strategy to achieve critical mass within our school will be used. At our school, a teacher will be selected at each grade level. The teacher will be selected by a committee consisting of the school's principal, members of the technology department, and the school library media specialists. The teacher selected at each grade level will be one who has previously demonstrated innovativeness in educational technology as well as the willingness to try and implement new things.













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